939Dual-SATA2

User Manual

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(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

ASRock Website: http://www.asrock.com

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1. Introduction

Thank you for purchasing ASRock ***939Dual-SATA2*** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.

Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest memory and CPU support lists on ASRock website as well. ASRock website http://www.asrock.com

1.1 Package Contents

1 x ASRock ***939Dual-SATA2*** Motherboard
(ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm)
1 x ASRock ***939Dual-SATA2*** Quick Installation Guide
1 x ASRock ***939Dual-SATA2*** Support CD
1 x Ultra ATA 66/100/133 IDE Ribbon Cable (80-conductor)
1 x 3.5-in Floppy Drive Ribbon Cable
1 x Serial ATA (SATA) Data Cable (Optional)
1 x Serial ATA (SATA) HDD Power Cable (Optional)
1 x ASRock 8CH I/O Shield

1.2 Specifications

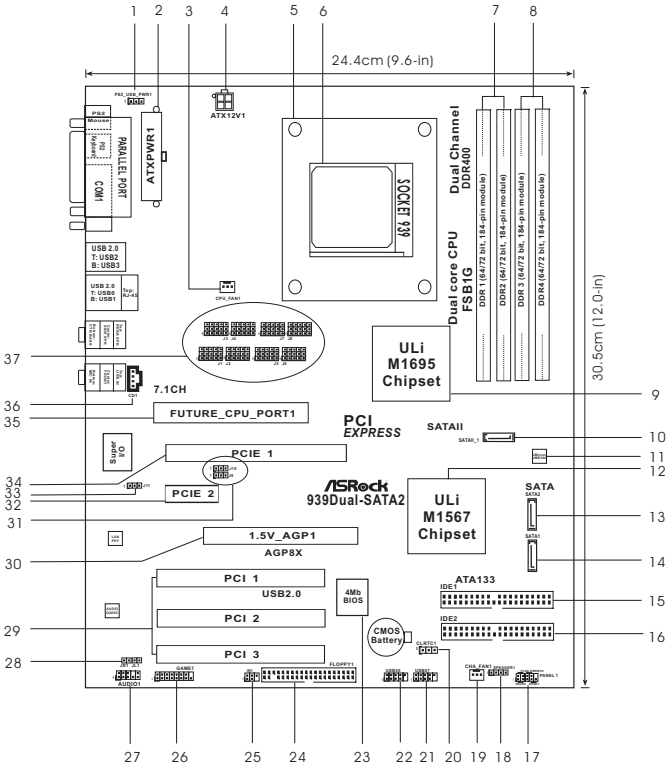
Platform:	ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm
CPU:	939-Pin Socket Supporting AMD Athlon™ 64 / 64FX Processor Supports AMD's Cool 'n' Quiet™ Technology (see **CAUTION 1**)
Chipsets:	North Bridge: ULi® M1695 chipset For 939-Pin CPU, FSB @ 1 GHz / 2.0 GT/s South Bridge: ULi® M1567 chipset, supports SATA 1.5Gb/s
Memory:	4 x DDR DIMM Slots: 4 DIMMs support PC3200 (DDR 400) / PC2700 (DDR 333) / PC2100 (DDR 266), Max. 4GB Dual Channel Memory Technology support (see **CAUTION 2**)
IDE:	IDE1: ATA 133 / Ultra DMA Mode 6 IDE2: ATA 133 / Ultra DMA Mode 6 Supports up to 4 IDE Devices
Serial ATA:	Supports up to 2 SATA devices at 1.5Gb/s data transfer rate (No support for "Hot Plug" functions)
Serial ATA II:	1 SATA II device at 3.0Gb/s data transfer rate (No support for "Hot Plug" functions)
Floppy Port:	Supports up to 2 Floppy Disk Drives
Audio:	7.1 channels AC'97 Audio
LAN:	Speed: 802.3u (10/100 Ethernet), Supports Wake-On-LAN
Hardware Monitor:	CPU Temperature Sensing Motherboard Temperature Sensing CPU Overheat Shutdown to Protect CPU Life (ASRock U-COP)(see **CAUTION 3**) CPU Fan Tachometer Chassis Fan Tachometer Voltage Monitoring: +12V, +5V, +3.3V, Vcore
Future CPU Port:	Supports CPU upgrade from AMD 939-Pin CPU to other future CPU, such as 940-Pin CPU (M2) (see **page 14** for details)
PCI Slots:	3 x PCI Slots, PCI Specification 2.2
PCI EXPRESS Slots:	1 slot with PCIE x 16, 1 slot with PCIE x 1; PCIE Specification 1.0a
AGP Slot:	1 x AGP Slot Supports 1.5V, 8X / 4X AGP Card (see **CAUTION 4**)
USB 2.0:	8 USB 2.0 Ports: 4 Ready-to-Use USB 2.0 Ports on the I/O Panel Plus 2 On-Board Headers Supporting 4 Extra USB 2.0 Ports (see **CAUTION 5**)

ASRock 8CH I/O:	1 PS/2 Mouse Port, 1 PS/2 Keyboard Port 1 Serial Port: COM1 1 Parallel Port (ECP/EPP Support) 4 Ready-to-Use USB 2.0 Ports 1 RJ-45 Port Audio Jack: Side Speaker / Rear Speaker / Central/Bass / Line In / Front Speaker / Microphone (see **CAUTION 6**)
BIOS:	AMI Legal BIOS Supports "Plug and Play" ACPI 1.1 Compliance Wake Up Events SMBIOS 2.3.1 Support CPU Frequency Stepless Control (only for advanced users' reference, see **CAUTION 7**)
OS:	Microsoft® Windows® 98 SE / ME / 2000 / XP / XP 64-bit compliant

CAUTION!

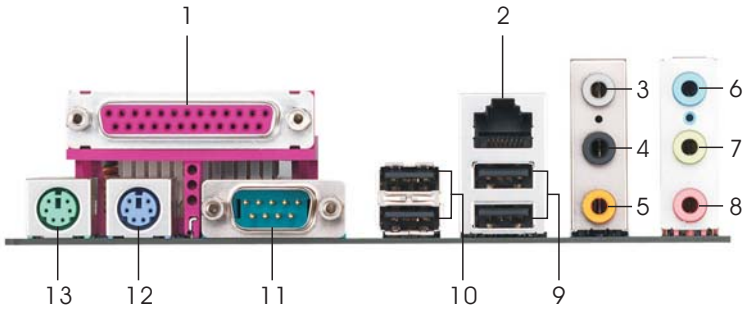
1. For power-saving's sake, it is strongly recommended to enable AMD's Cool 'n' Quiet™ technology under Windows system. See APPENDIX on page 40 to enable AMD's Cool 'n' Quiet™ technology.
2. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 12 for proper installation.
3. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.
4. Do NOT use a 3.3V AGP card on the AGP slot of this motherboard! It may cause permanent damage!
5. Power Management for USB 2.0 works fine under Microsoft® Windows® XP SP1 / 2000 SP4. It may not work properly under Microsoft® Windows® 98/ ME.
6. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 4-channel, 6-channel, and 8-channel modes. Please check the table on page 9 for proper connection.
7. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.

1.3 Motherboard Layout



1	PS2_USB_PWR1 Jumper
2	ATX Power Connector (ATXPWR1)
3	CPU Fan Connector (CPU_FAN1)
4	ATX 12V Power Connector (ATX12V1)
5	CPU Heatsink Retention Module
6	939-Pin CPU Socket
7	2 x 184-pin DDR DIMM Slots (Dual Channel A: DDR1, DDR2; Blue)
8	2 x 184-pin DDR DIMM Slots (Dual Channel B: DDR3, DDR4; Black)
9	North Bridge Controller
10	Serial ATAII Connector (SATAII_1, red)
11	JMicron JMB360 Chipset (PCIEX1 interface)
12	South Bridge Controller
13	Secondary Serial ATA Connector (SATA2)
14	Primary Serial ATA Connector (SATA1)
15	Primary IDE Connector (IDE1, Blue)
16	Secondary IDE Connector (IDE2, Black)
17	System Panel Header (PANEL1)
18	Chassis Speaker Header (SPEAKER 1)
19	Chassis Fan Connector (CHA_FAN1)
20	Clear CMOS Jumper (CLRTC1)
21	USB 2.0 Header (USB67, Blue)
22	USB 2.0 Header (USB45, Blue)
23	Flash Memory
24	Floppy Connector (FLOPPY1)
25	Infrared Module Header (IR1)
26	Game Port Header (GAME1)
27	Front Panel Audio Header (AUDIO1)
28	JR1 JL1 Jumper
29	PCI Slots (PCI1- 3)
30	AGP Slot (1.5V_AGP1)
31	J9 / J10 Jumper
32	PCI EXPRESS Slot (PCIE2)
33	J11 Jumper
34	PCI EXPRESS Slot (PCIE1)
35	Future CPU Port (FUTURE_CPU_PORT1)
36	Internal Audio Connector: CD1 (Black)
37	J1-J8 Jumpers

1.4 ASRock 8CH I/O



1	Parallel Port	8	Microphone (Pink)
2	RJ-45 Port	9	USB 2.0 Ports (USB01)
3	Side Speaker (Gray)	10	USB 2.0 Ports (USB23)
4	Rear Speaker (Black)	11	Serial Port: COM1
5	Central / Bass (Orange)	12	PS/2 Keyboard Port (Purple)
6	Line In (Light Blue)	13	PS/2 Mouse Port (Green)
*7	Front Speaker (Lime)		

* If you use 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.

TABLE for Audio Output Connection

Audio Output Channels	Front Speaker (No. 7)	Rear Speaker (No. 4)	Central / Bass (No. 5)	Side Speaker (No. 3)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

2. Installation

939Dual-SATA2 is an ATX form factor (12.0-in x 9.6-in, 30.5 cm x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

2.1 CPU Installation

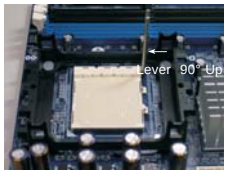
Step 1. Unlock the socket by lifting the lever up to a 90° angle.

Step 2. Position the CPU directly above the socket such that the CPU corner with the golden triangle matches the socket corner with a small triangle.

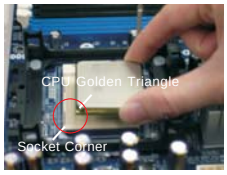
Step 3. Carefully insert the CPU into the socket until it fits in place.

The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.

Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



STEP 1:
Lift Up The Socket Lever



STEP 2 / STEP 3:
Match The CPU Golden Triangle To The Socket Corner

STEP 4:
Push Down And Lock The Socket Lever

2.2 Installation of CPU Fan and Heatsink

After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU FAN connector (CPU_FAN1, see Page 8, No. 3). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

2.3 Installation of Memory Modules (DIMM)

939Dual-SATA2 motherboard provides four 184-pin DDR (Double Data Rate) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install **identical** (the same brand, speed, size and chip-type) DDR DIMM pair in the slots of the same color. In other words, you have to install **identical** DDR DIMM pair in **Dual Channel A** (DDR1 and DDR2; Blue slots; see p.8 No.7) or **identical** DDR DIMM pair in **Dual Channel B** (DDR3 and DDR4; Black slots; see p.8 No.8), so that Dual Channel Memory Technology can be activated. This motherboard also allows you to install four DDR DIMMs for dual channel configuration, and please install **identical** DDR DIMMs in all four slots. You may refer to the Dual Channel Memory Configuration Table below.

Dual Channel Memory Configurations

	DDR1 (Blue Slot)	DDR2 (Blue Slot)	DDR3 (Black Slot)	DDR4 (Black Slot)
(1)	Populated	Populated	-	-
(2)	-	-	Populated	Populated
(3)*	Populated	Populated	Populated	Populated

* For the configuration (3), please install **identical** DDR DIMMs in all four slots.

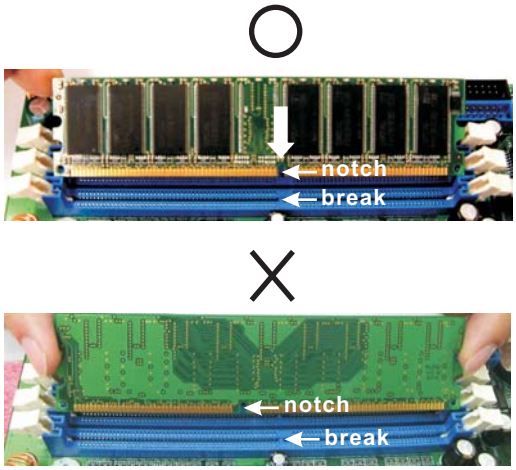
1. If you want to install two memory modules, for optimal compatibility and reliability, it is recommended to install them in the slots of the same color. In other words, install them either in the set of blue slots (DDR1 and DDR2), or in the set of black slots (DDR3 and DDR4).
2. If only one memory module or three memory modules are installed in the DDR DIMM slots on this motherboard, it is unable to activate the Dual Channel Memory Technology.
3. If a pair of memory modules is NOT installed in the same Dual Channel, for example, installing a pair of memory modules in DDR1 and DDR3, it is unable to activate the Dual Channel Memory Technology .

Installing a DIMM

Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

Step 1. Unlock a DIMM slot by pressing the retaining clips outward.

Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

2.4 Expansion Slots

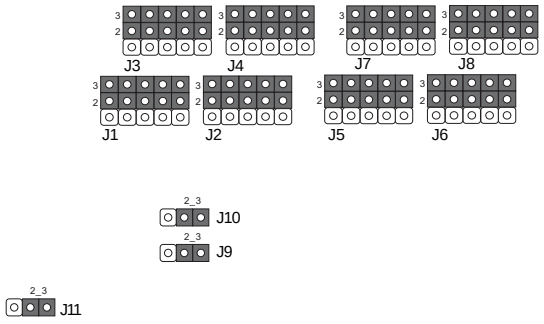
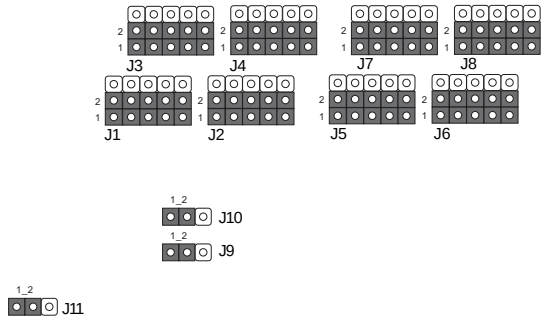
(Future CPU Port, PCI Slots, PCIE Slots, and AGP Slot)

There are 1 Future CPU Port, 3 PCI slots, 2 PCIE slots, and 1 AGP slot on ***939Dual-SATA2*** motherboard.

Future CPU Port (Yellow-Colored Port):

Future CPU Port allows you to upgrade your AMD 939-Pin CPU to AMD 940-Pin CPU by installing an add-on ASRock **M2CPU Board** into this future CPU Port on ***939Dual-SATA2*** motherboard. Before you upgrade the 939-Pin CPU to the 940-Pin (M2) CPU, it is necessary to adjust the jumper settings for those required jumpers on ***939Dual-SATA2*** motherboard. Please refer to the table below for the correct jumper settings.

This yellow-colored Future CPU Port is not an AGP slot! Please do NOT insert any AGP card into it!

CPU Type	Jumper Settings
939-Pin CPU (Default)	
940-Pin (M2) CPU (Using add-on ASRock **M2CPU Board**)	

NOTE

When adjusting the jumper settings, you may use the tool, Jumper Cap Remover, to help you removing the jumper caps more easily. This Jumper Cap Remover is bundled in your motherboard package, and please follow the "Jumper Cap Remover Instruction" to use it properly.

PCI Slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIE Slots: PCIE1 (PCIE x 16 slot) is used for PCI Express cards with x16 lane width graphics cards.
PCIE2 (PCIE x 1 slot) is used for PCI Express cards, such as Gigabit LAN card, SATA2 card, etc.

AGP slot: The AGP slot is used to install a graphics card. The ASRock AGP slot has a special design of clasp that can securely fasten the inserted graphics card.

Please do NOT use a 3.3V AGP card on the AGP slot of this motherboard! It may cause permanent damage! For the voltage information of your AGP card, please check with the AGP card vendors.

Installing an expansion card

Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.

Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).

Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.

Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5. Fasten the card to the chassis with screws.

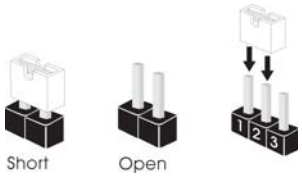
Step 6. Replace the system cover.

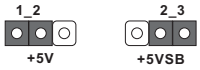
2.5 Surround Display Feature

This motherboard supports Surround Display upgrade. With the external add-on PCI VGA card and PCI Express VGA card, you can easily enjoy the benefits of Surround Display feature. For the detailed instruction, please refer to the document at the following path in the Support CD: **..\ Surround Display**

2.6 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



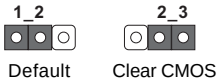
Jumper	Setting	
PS2_USB_PWR1 (see p.8, No. 1)		Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

JR1 JL1 Jumper (see p.8, No. 28)

Note: If the jumpers JL1 and JR1 are short, both the front panel and the rear panel audio connectors can work.

Clear CMOS Jumper (CLRTC1) (see p.8, No. 20)

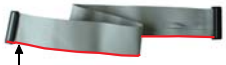


Note: CLRTC1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRTC1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action.

2.7 Onboard Headers and Connectors

Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

Floppy Connector
(33-pin FLOPPY1)
(see p.8 No. 24)



Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE Connector (Blue)
(39-pin IDE1, see p.8 No. 15)

Secondary IDE Connector (Black)
(39-pin IDE2, see p.8 No. 16)

connect the blue end to the motherboard

connect the black end to the IDE devices

80-conductor ATA 66/100/133 cable

Note: If you use only one IDE device on this motherboard, please set the IDE device as “Master”. Please refer to the instruction of your IDE device vendor for the details. Besides, to optimize compatibility and performance, please connect your hard disk drive to the primary IDE connector (IDE1, blue) and CD-ROM to the secondary IDE connector (IDE2, black).

Serial ATA Connectors
(SATA1: see p.8 No. 14)
(SATA2: see p.8 No. 13)

These two Serial ATA (SATA) connectors support SATA data cables for internal storage devices. The current SATA interface allows up to 1.5 Gb/s data transfer rate.

Serial ATA II Connector
(SATA II_1: see p.8 No. 10)

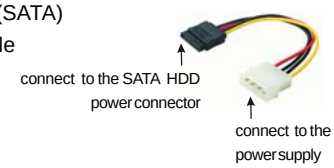
This Serial ATA II (SATA II) connector supports SATA II data cables for internal storage devices. The current SATA II interface allows up to 3.0 Gb/s data transfer rate.

It is recommended to plug SATAII HDD to SATAII connector (SATAII_1) and connect SATA HDD to SATA connector (SATA1 or SATA2).

Serial ATA (SATA) Data Cable

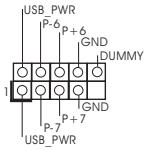
Either end of the SATA data cable can be connected to the SATA hard disk or the SATA connector on the motherboard.

Serial ATA (SATA)
Power Cable
(Optional)



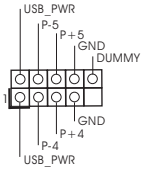
Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

USB 2.0 Header
(9-pin USB67)
(see p.8 No. 21)



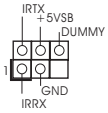
ASRock 8CH I/O accommodates 4 default USB 2.0 ports. If those USB 2.0 ports on the I/O panel are not sufficient, this USB 2.0 header is available to support 2 additional USB 2.0 ports.

USB 2.0 Header
(9-pin USB45)
(see p.8 No. 22)



ASRock 8CH I/O accommodates 4 default USB 2.0 ports. If those USB 2.0 ports on the I/O panel are not sufficient, this USB 2.0 header is available to support 2 additional USB 2.0 ports.

Infrared Module Header
(5-pin IR1)
(see p.8 No. 25)



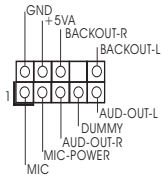
This header supports an optional wireless transmitting and receiving infrared module.

Internal Audio Connectors
(4-pin CD1)
(CD1: see p.8 No. 36)

CD1

This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

Front Panel Audio Header
(9-pin AUDIO1)
(see p.8 No. 27)

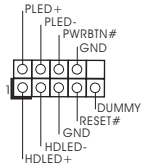


This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

System Panel Header

(9-pin PANEL1)

(see p.8 No. 17)

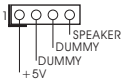


This header accommodates several system front panel functions.

Chassis Speaker Header

(4-pin SPEAKER 1)

(see p.8 No. 18)

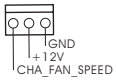


Please connect the chassis speaker to this header.

Chassis Fan Connector

(3-pin CHA_FAN1)

(see p.8 No. 19)

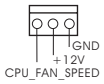


Please connect a chassis fan cable to this connector and match the black wire to the ground pin.

CPU Fan Connector

(3-pin CPU_FAN1)

(see p.8 No. 3)



Please connect the CPU fan cable to this connector and match the black wire to the ground pin.

ATX Power Connector

(20-pin ATXPWR1)

(see p.8 No. 2)

Please connect an ATX power supply to this connector.

ATX 12V Power Connector

(4-pin ATX12V1)

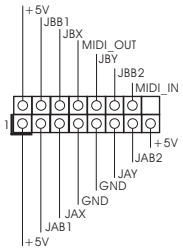
(see p.8 No. 4)

Please note that it is necessary to connect a power supply with ATX 12V plug to this connector. Failing to do so will cause power up failure.

Game Port Header

(15-pin GAME1)

(see p.8 No. 26)



Connect a Game cable to this header if the Game port bracket is installed.

2.8 Serial ATA (SATA) Hard Disks Installation

This motherboard adopts JMicron JMB360 chipset that supports Serial ATAII (SATAII) hard disk. It also adopts ULi M1567 south bridge chipset that supports Serial ATA (SATA) hard disks, and supports RAID functions. You may install SATA hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA hard disks.

STEP 1: Install the SATA hard disks into the drive bays of your chassis.
STEP 2: Connect the SATA power cable to the SATA hard disk.
STEP 3: Connect one end of the SATA data cable to the motherboard's SATA connector.
STEP 4: Connect the other end of the SATA data cable to the SATA hard disk.

1. If you plan to use RAID 0, RAID 1, or JBOD functions on SATA, SATA HDDs must be operated in "RAID" mode.
2. "RAID" and "non-RAID" mode are options under "SATA Operation Mode" in BIOS setup. Please refer to page 30 for details. They need different drivers during actual operation.

2.9 Making a SATA Driver Diskette For SATA Operation in "RAID" Mode

If you want to install Windows 2000, Windows XP, or Windows XP 64-bit OS on your SATA HDDs, you will need to make a SATA driver diskette before you start the OS installation.

STEP 1: Insert the ASRock Support CD into your optical drive to boot your system. (Do NOT insert any floppy diskette into the floppy drive at this moment!)
STEP 2: During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.
STEP 3: When you see the message on the screen, "Do you want to generate Serial ATA driver diskette [YN]?", press <Y>.
STEP 4: Then you will see these messages,

Please insert a diskette into the floppy drive.
WARNING! Formatting the floppy diskette will lose ALL data in it!
Start to format and copy files [YN]?

Please insert a floppy diskette into the floppy drive, and press <Y>.
STEP 5: The system will start to format the floppy diskette and copy SATA drivers into the floppy diskette.

Once you have the SATA driver diskette ready, you may start to install Windows 2000 / Windows XP / Windows XP 64-bit on your system directly without setting the RAID configuration on your system, or you may start to use "RAID Installation Guide" to set RAID 0 / RAID 1 / JBOD configuration before you install the OS. Before you start to configure the RAID function, you need to check the installation guide in the Support CD for proper configuration. Please find the document, "Guide to SATA Hard Disks Installation and RAID Configuration", at the following path in the Support CD:

.. \ Information \ Manual \ RAID Installation Guide \ English.pdf

2.10 SATA Operating in "non-RAID" Mode

If you want to install Windows 2000, Windows XP, or Windows XP 64-bit OS on your SATA HDDs operating in non-RAID mode, you don't need to make a SATA driver diskette before OS installation.

Windows 98 SE and Windows ME must be installed by SATA operating in RAID mode, and you don't need to make a SATA driver diskette for these two OS before OS installation.

2.11 SATAII Operating in "IDE" Mode

If you want to install Windows 98 SE, Windows ME, Windows 2000, Windows XP, or Windows XP 64-bit OS on your SATAII HDDs operating in IDE mode, you don't need to make a SATAII driver diskette before OS installation.

2.12 Making a SATAII Driver Diskette For SATAII Operation in "SATA" Mode

If you want to install Windows 2000, Windows XP, or Windows XP 64-bit OS on your SATAII HDDs, you will need to make a SATAII driver diskette before you start the OS installation. You need to copy the SATAII driver package to a diskette and use it while OS queries for other boot device driver diskette. (Please see the "Readme.txt" in SATAII driver directory on the support CD for the files needed to copy to the diskette.)

3. BIOS SETUP UTILITY

3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The Flash Memory on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

Main	To set up the system time/date information
Advanced	To set up the advanced BIOS features
H/W Monitor	To display current hardware status
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Exit	To exit the current screen or the BIOS SETUP UTILITY

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

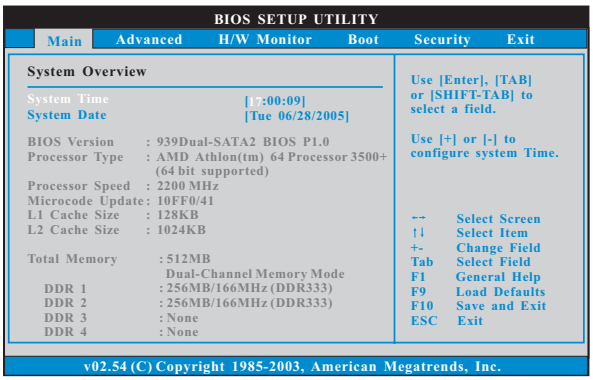
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview.



System Time [Hour:Minute:Second]

Use this item to specify the system time.

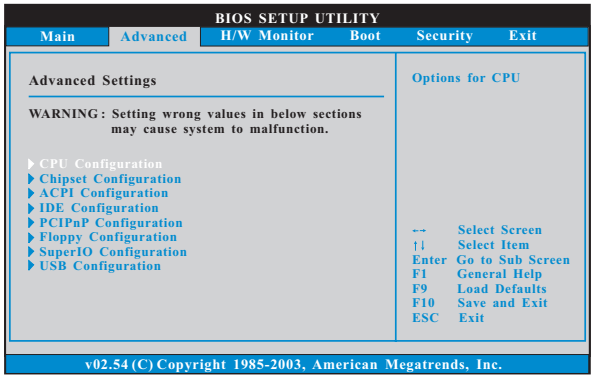
System Date [Day Month/Date/Year]

Use this item to specify the system date.

In the future, you may upgrade your AMD 939-Pin CPU to AMD 940-Pin (M2) CPU by installing an add-on ASRock **M2CPU Board** into future CPU Port on this motherboard

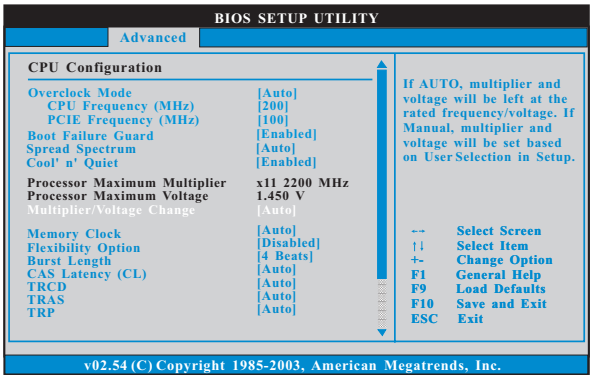
3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, IDE Configuration, PCIPnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.



Setting wrong values in this section may cause the system to malfunction.

3.3.1 CPU Configuration


BIOS SETUP UTILITY
Advanced
CPU Configuration
Overclock Mode [Auto]
CPU Frequency (MHz) [200]
PCIE Frequency (MHz) [100]
Boot Failure Guard [Enabled]
Spread Spectrum [Auto]
Cool' n' Quiet [Enabled]
Processor Maximum Multiplier x11 2200 MHz
Processor Maximum Voltage 1.450 V
Multiplier/Voltage Change [Auto]
Memory Clock [Auto]
Flexibility Option [Disabled]
Burst Length [4 Beats]
CAS Latency (CL) [Auto]
TRCD [Auto]
TRAS [Auto]
TRP [Auto]
If AUTO, multiplier and voltage will be left at the rated frequency/voltage. If Manual, multiplier and voltage will be set based on User Selection in Setup.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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Overclock Mode

Use this to select Overclock Mode. The default value is [Auto]. Cnfiguration options: [Auto], [CPU, PCIE, Sync.] and [CPU, PCIE, Async.].

CPU Frequency (MHz)

Use this option to adjust CPU frequency. The range is from 140MHz to 300MHz. The default value is [200].

PCIE Frequency (MHz)

Use this option to adjust PCIE frequency. The range is from 70MHz to 150MHz. The default value is [100].

Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

Spread Spectrum

This feature will be set to [Auto] as default.

Cool 'n' Quiet

Use this item to enable or disable AMD's Cool 'n' Quiet™ technology.

Processor Maximum Multiplier

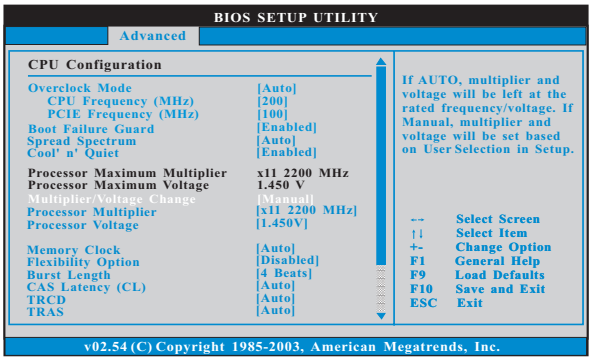
It will display Processor Maximum Multiplier for reference.

Processor Maximum Voltage

It will display Processor Maximum Voltage for reference.

Multiplier/Voltage Change

This item is set to [Auto] by default. If it is set to [Manual], you may adjust the value of Processor Multiplier and Processor Voltage. However, it is recommended to keep the default value for system stability.


BIOS SETUP UTILITY
Advanced
CPU Configuration
Overclock Mode [Auto]
CPU Frequency (MHz) [200]
PCIE Frequency (MHz) [100]
Boot Failure Guard [Enabled]
Spread Spectrum [Auto]
Cool' n' Quiet [Enabled]
Processor Maximum Multiplier x11 2200 MHz
Processor Maximum Voltage 1.450 V
Multiplier/Voltage Change [Manual]
Processor Multiplier [x11 2200 MHz]
Processor Voltage [1.450V]
Memory Clock [Auto]
Flexibility Option [Disabled]
Burst Length [4 Beats]
CAS Latency (CL) [Auto]
TRCD [Auto]
TRAS [Auto]
If AUTO, multiplier and voltage will be left at the rated frequency/voltage. If Manual, multiplier and voltage will be set based on User Selection in Setup.
-- Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
v02.54 (C) Copyright 1985-2003, American Megatrends, Inc.

Processor Multiplier

This item will show when “Multiplier/Voltage Change” is set to [Manual]; otherwise, it will be hidden. You may set the value from [x8 1600 MHz] up to [x25 5000 MHz] but no higher than the value of “Processor Maximum Multiplier”. For example, if the value of “Processor Maximum Multiplier” is [x11 2200 MHz], the actual value of multiplier will be [x11 2200 MHz] even if you set this item to a value higher than [x11 2200 MHz]. However, for system stability, it is not recommended to adjust the value of this item.

Processor Voltage

This item will show when “Multiplier/Voltage Change” is set to [Manual]; otherwise, it will be hidden. For safety and system stability, it is not recommended to adjust the value of this item.

Memory Clock

This item can be set by the code using [Auto]. You can set one of the standard values as listed: [133 MHz (DDR266)], [166 MHz (DDR333)], [200 MHz (DDR400)].

Flexibility Option

The default value of this option is [Disabled]. It will allow better tolerance for memory compatibility when it is set to [Enabled].

Burst Length

Burst length can be set to 8 or 4 beats. 64 Bit Dq must use the 4 beats.

CAS Latency (CL)

Use this item to adjust the means of memory accessing. Configuration options: [Auto], [2.0], [3.0], and [2.5].

TRCD

Use this to adjust TRCD values. Configuration options: [Auto], [2CLK], [3CLK], [4CLK], [5CLK], and [6CLK].

TRAS

Use this to adjust TRAS values. Configuration options: [Auto], [5CLK], [6CLK], [7CLK], [8CLK], [9CLK], [10CLK], [11CLK], [12CLK], [13CLK], [14CLK], and [15CLK].

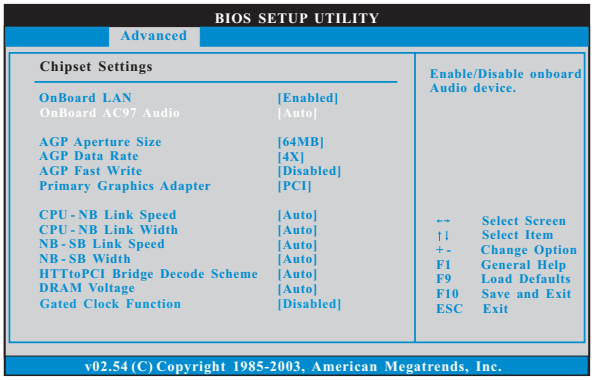
TRP

Use this to adjust TRP values. Configuration options: [Auto], [2CLK], [3CLK], [4CLK], [5CLK], and [6CLK].

MA Timing

Use this to adjust values for MA timing. Configuration options: [Auto], [2T], [1T]. The default value is [Auto].

3.3.2 Chipset Configuration



OnBoard LAN

This allows you to enable or disable the onboard LAN feature.

OnBoard AC97 Audio

Select [Auto] or [Disabled] for the onboard AC97 Audio feature.

AGP Aperture Size

It refers to a section of the PCI memory address range used for graphics memory. It is recommended to leave this field at the default value unless the installed AGP card's specifications requires other sizes. Configuration options: [32MB], [64MB], [128MB], and [256MB].

AGP Data Rate

Use this item to adjust the AGP Data Rate. Configuration options: [8X], [4X].

AGP Fast Write

This allows you to enable or disable the feature of AGP fast write protocol support.

Primary Graphics Adapter

This item will switch the PCI Bus scanning order while searching for video card. It allows you to select the type of Primary VGA in case of multiple video controllers. The default value of this feature is [PCI]. Configuration options: [PCI], [PCIE] and [AGP].

CPU - NB Link Speed

This feature allows you selecting CPU to NB link frequency. Configuration options: [Auto], [200 MHz], [400 MHz], [600 MHz], [800 MHz], and [1000 MHz].

CPU - NB Link Width

This feature allows you selecting CPU to NB link width. Configuration options: [Auto], [8 BIT], and [16 BIT].

NB - SB Link Speed

This feature allows you selecting NB to SB link frequency. Configuration options: [Auto], [200 MHz], [400 MHz], [600 MHz], [800 MHz], and [1000 MHz].

NB - SB Width

This feature allows you selecting NB to SB link width. Configuration options: [Auto], [8 BIT], and [16 BIT].

HTTtoPCI Bridge Decode Scheme

Use this to select HTT to PCI bridge decode scheme. Configuration options: [Auto], [Positive], and [Subtractive].

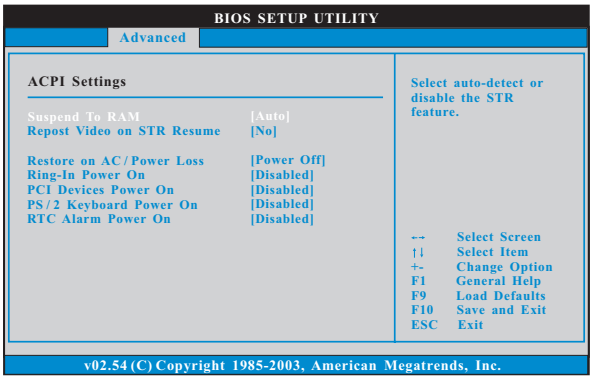
DRAM Voltage

Use this to select DRAM voltage. Configuration options: [Auto], [High], [Normal]. The default value is [Auto].

Gated Clock Function

You can enable or disable gated clock function. Configuration options: [Enabled], [Disabled].

3.3.3 ACPI Configuration


BIOS SETUP UTILITY
Advanced
ACPI Settings
Suspend To RAM [Auto]
Repost Video on STR Resume [No]
Restore on AC/Power Loss [Power Off]
Ring-In Power On [Disabled]
PCI Devices Power On [Disabled]
PS/2 Keyboard Power On [Disabled]
RTC Alarm Power On [Disabled]
Select auto-detect or disable the STR feature.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it. If you set this item to [Disabled], the function “Repost Video on STR Resume” will be hidden.

Repost Video on STR Resume

This feature allows you to repost video on STR resume. It is recommended to enable this feature under Microsoft Windows 98 / ME. (STR refers to suspend to RAM.)

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

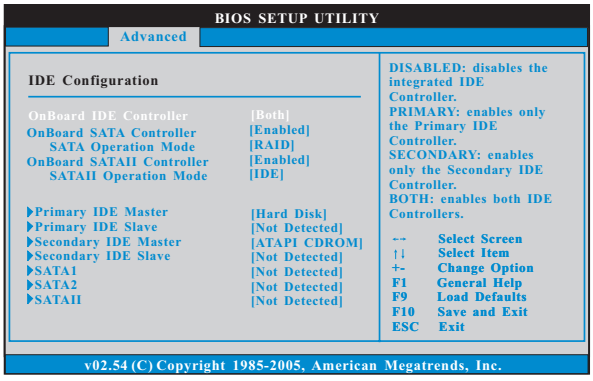
PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

3.3.4 IDE Configuration


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard IDE Controller [Both]
OnBoard SATA Controller [Enabled]
SATA Operation Mode [RAID]
OnBoard SATAII Controller [Enabled]
SATAII Operation Mode [IDE]
Primary IDE Master [Hard Disk]
Primary IDE Slave [Not Detected]
Secondary IDE Master [ATAPI CDROM]
Secondary IDE Slave [Not Detected]
SATA1 [Not Detected]
SATA2 [Not Detected]
SATAII [Not Detected]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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OnBoard IDE Controller

You may enable either the primary IDE channel or the secondary IDE channel. Or you may enable both the primary and the secondary IDE channels by selecting [Both]. Set to [Disabled] will disable the both. Configuration options: [Disabled], [Primary], [Secondary], [Both].

OnBoard SATA Controller

Enable the onboard SATA controller by selecting [Enabled]. The default value of this option is [Enabled]. Configuration options: [Enabled], [Disabled], [Auto].

SATA Operation Mode

Use this item to adjust SATA Operation Mode. The default value of this option is [RAID]. Configuration options: [RAID], [non-RAID].

OnBoard SATAII Controller

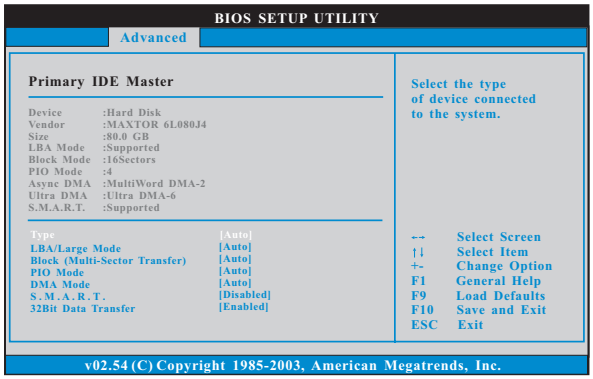
Enable the onboard SATAII controller by selecting [Enabled]. The default value of this option is [Enabled]. Configuration options: [Enabled], [Disabled], [Auto].

SATAII Operation Mode

Use this item to adjust SATAII Operation Mode. The default value of this option is [IDE]. Configuration options: [IDE], [SATA].

IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the “Primary IDE Master” as the example in the following instruction, which can be applied to the configurations of “Primary IDE Slave”, “Secondary IDE Master”, and “Secondary IDE Slave” as well.



TYPE

Use this item to configure the type of the IDE device that you specify. Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

[Not Installed]: Select [Not Installed] to disable the use of IDE device.

[Auto]: Select [Auto] to automatically detect the hard disk drive.

After selecting the hard disk information into BIOS, use a disk utility, such as FDISK, to partition and format the new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

[CD/DVD]: This is used for IDE CD/DVD drives.

[ARMD]: This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

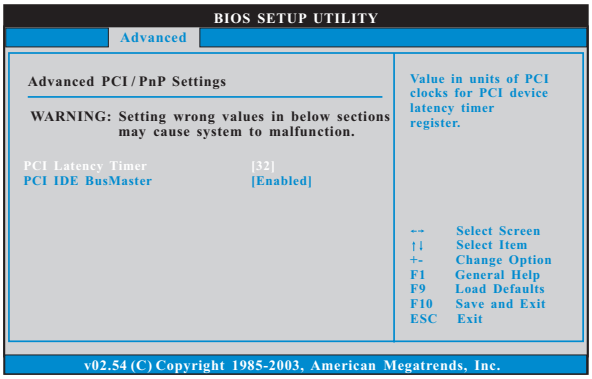
S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

32-Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

3.3.5 PCIPnP Configuration


BIOS SETUP UTILITY
Advanced
Advanced PCI / PnP Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
PCI Latency Timer [32]
PCI IDE BusMaster [Enabled]
Value in units of PCI clocks for PCI device latency timer register.
←→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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Setting wrong values in this section may cause the system to malfunction.

PCI Latency Timer

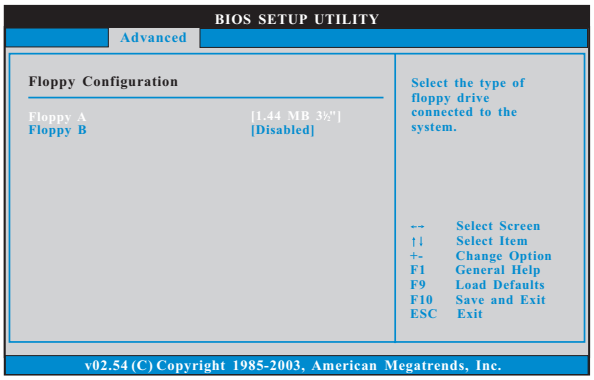
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

PCI IDE BusMaster

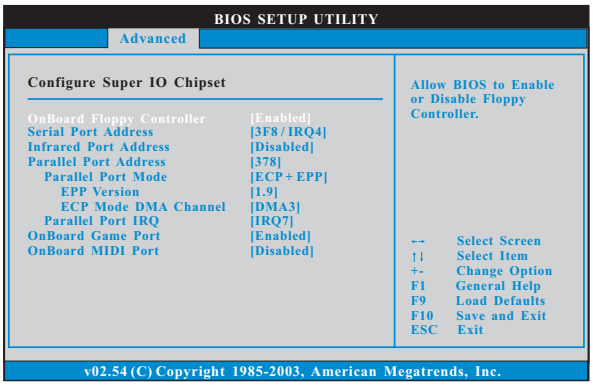
Use this item to enable or disable the PCI IDE BusMaster feature.

3.3.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



3.3.7 Super IO Configuration


BIOS SETUP UTILITY
Advanced
Configure Super IO Chipset
OnBoard Floppy Controller [Enabled]
Serial Port Address [3F8 / IRQ4]
Infrared Port Address [Disabled]
Parallel Port Address [378]
Parallel Port Mode [ECP + EPP]
EPP Version [1.9]
ECP Mode DMA Channel [DMA3]
Parallel Port IRQ [IRQ7]
OnBoard Game Port [Enabled]
OnBoard MIDI Port [Disabled]
Allow BIOS to Enable or Disable Floppy Controller.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

Serial Port Address

Use this item to set the address for the onboard serial port or disable it.

Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it.

Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].

Parallel Port Address

Use this item to set the address for the onboard parallel port or disable it. Configuration options: [Disabled], [378], and [278].

Parallel Port Mode

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

EPP Version

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

ECP Mode DMA Channel

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

Parallel Port IRQ

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

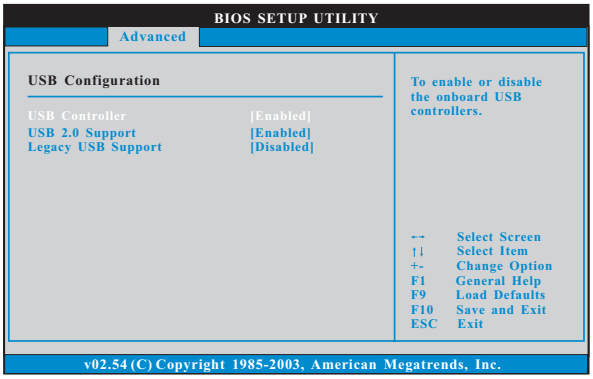
OnBoard Game Port

Use this item to enable the Game Port or disable it.

OnBoard MIDI Port

Use this itme to select the address for the MIDI Port or disable it. Configuration options: [Disabled], [300], and [330].

3.3.8 USB Configuration



USB Controller

Use this item to enable or disable the use of USB controller.

USB 2.0 Support

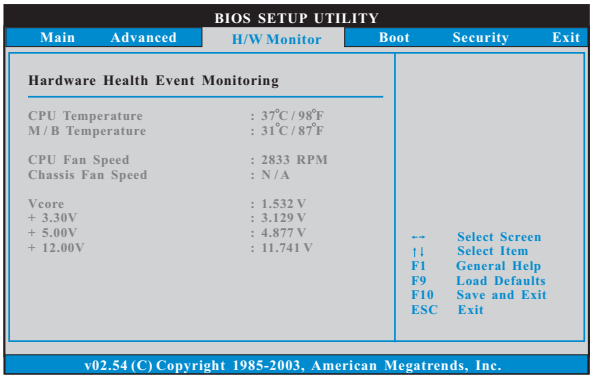
Use this item to enable or disable the USB 2.0 support.

Legacy USB Support

Use this item to enable or disable the support to emulate legacy I/O devices such as mouse, keyboard,... etc. Or you may select [Auto] so that the system will start to auto-detect; if there is no USB device connected, "Auto" option will disable the legacy USB support.

3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.


BIOS SETUP UTILITY
Main Advanced H/W Monitor Boot Security Exit
Hardware Health Event Monitoring
CPU Temperature : 37°C / 98°F
M/B Temperature : 31°C / 87°F
CPU Fan Speed : 2833 RPM
Chassis Fan Speed : N/A
Vcore : 1.532 V
+ 3.30V : 3.129 V
+ 5.00V : 4.877 V
+ 12.00V : 11.741 V
←→ Select Screen
↑↓ Select Item
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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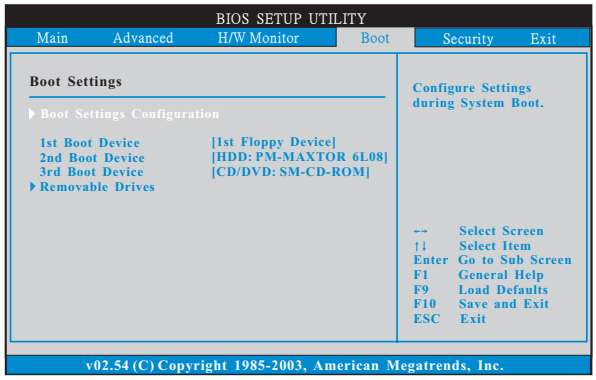
3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.


BIOS SETUP UTILITY
Main Advanced H/W Monitor Boot Security Exit
Boot Settings
Boot Settings Configuration
1st Boot Device [1st Floppy Device]
2nd Boot Device [HDD: PM-MAXTOR 6L08]
3rd Boot Device [CD/DVD: SM-CD-ROM]
Removable Drives
Configure Settings during System Boot.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit
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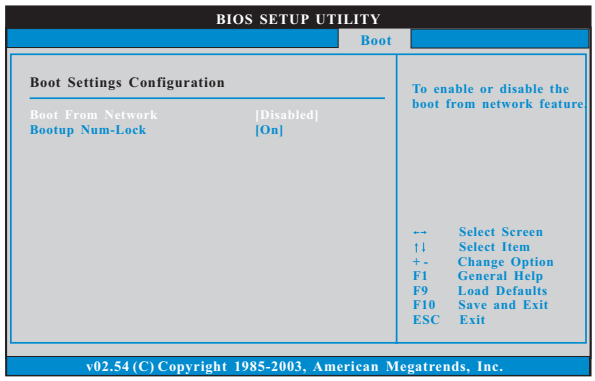
3.5.1 Boot Settings Configuration



Boot From Network

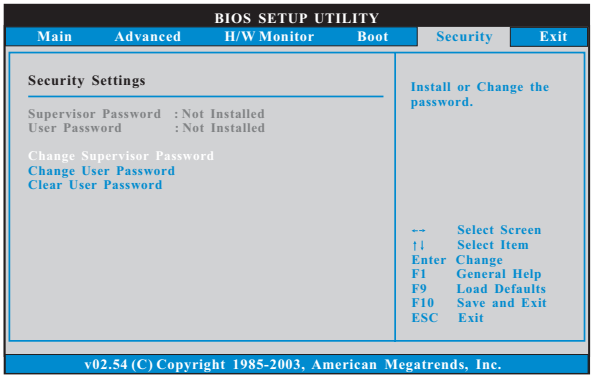
Use this item to enable or disable the Boot From Network feature.

Boot Up Num-Lock

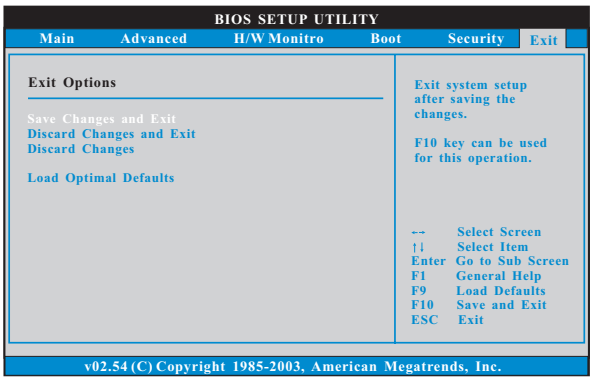
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

3.6 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



3.7 Exit Screen



Save Changes and Exit

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

Discard Changes and Exit

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

Load Optimal Defaults

When you select this option, it will pop-out the following message, "Load optimal defaults?" Select [OK] to load the default values for all the setup configurations.

4. Software Support

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 98 SE / ME / 2000 / XP / XP 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

4.2.2 Drivers Menu

The Drivers Menu shows the available devices drivers if the system detects the installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at http://www.asrock.com; or you may contact your dealer for further information.

APPENDIX:
AMD's Cool 'n' Quiet™ Technology

For power-saving sake, it is strongly recommended to enable AMD's Cool 'n' Quiet™ technology under Windows system. When using this feature, please make sure to install "AMD Processor Driver" from the "Support CD" first.

If you are using Windows 2000/XP operating system, please follow the instruction below to enable AMD's Cool 'n' Quiet™ technology:

1. From the Windows 2000/XP operating system, click the Start button. Select Settings, then Control Panel.
2. Switch to Classic View. (for Windows XP only)
3. Double-click the Display icon in the Control Panel then select the Screen Saver tab.
4. Click the "Power…" button. The following dialog box appears.
5. From the Power schemes combo list box, select **Minimal Power Management**.
6. Click OK to implement settings.

If you are using Windows 98SE/ME operating system, please follow the instruction below to enable AMD's Cool 'n' Quiet™ technology:

1. From the Windows 98SE/ME operating system, click the Start button. Select Settings, then Control Panel.
2. Double-click the Display icon in the Control Panel then select the Screen Saver tab.
3. From the Energy saving features of monitor group, click the "Settings..." button.
4. From the Power Options Properties dialog box, select AMD's Cool 'n' Quiet™ Technology tab.
5. Click the Performance combo list box, to select desired mode. **Automatic mode** is the recommended setting.
6. Click OK to implement settings.